



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,847	09/15/2003	Alexander J. Roberts	GP-302409	1208
7590	12/05/2005		EXAMINER	
CHRISTOPHER DEVRIES			KLEBE, GERALD B	
General Motors Corporation			ART UNIT	PAPER NUMBER
Mail Code 482-C23-B21				
P.O. Box 300			3618	
Detroit, MI 48265-3000			DATE MAILED: 12/05/2005	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/662,847	ROBERTS, ALEXANDER J.
	Examiner Gerald B. Klebe	Art Unit 3618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 August 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,3-6,8-10 and 12-16 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,3-6,8-10 and 12-16 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 15 September 2003 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

*G.B. Klebe  
16 November 2005*

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### *Amendment*

1. The amendment filed 08/29/2005 under 37 CFR § 1.111 has been entered. Claims 1, 3-6, 8-10, and 12-16 are pending in the application, claims 2, 7, and 11 being cancelled by the amendment.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamai et al. (US 6307277).

Tamai et al. discloses a regenerative braking system for a vehicle (see Fig 1, and refer col 2, lines 21-29) comprising:

- a. **re: claim 1:** a displacement on demand (DOD) engine (Fig 1, item 12) including cylinders (refer col 2, lines 40-41);  
a battery (24);  
an electric machine (18) that has motor and generator modes (col 6, lines 55-59) and that is selectively driven by a wheel of the vehicle (col 9, lines 9-17); and,  
a controller (25) that detects a braking condition of the vehicle, that deactivates at least one of the cylinders in response to the braking condition (col 9, line 9 to col 10, line 5), and

that operates the electric machine in the generator mode during the braking condition to charge the battery.

The system of Tamai et al. proceeds to deactivate all cylinders of the engine when in the regenerative braking state rather than maintain at least another of the cylinders active.

However, Bhavsar et al. teaches a propulsion system for a hybrid vehicle comprising a DOD engine (Fig 1, item 16; and refer col 3, lines 35-36), battery (15), electric machine (14) that has motor and generator modes (col 3, line 62 to col 4, line 3) and that is selectively driven by a wheel of the vehicle (col 3, lines 36-38), the system further comprising a controller (18) that is able to detect a condition of the vehicle and selectively deactivate at least one of the engine cylinders while maintaining at least another of the cylinders active (refer col 4, lines 21-24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to have modified the system of Tamai et al. to control the cylinders such that in response to a braking condition of the vehicle, while deactivating one or more of the engine cylinders, at least another of the cylinders would be maintained active in response to the braking condition in accordance with the teachings of Bhavsar et al. in order to save fuel while preserving some engine cylinder activation to respond-to driver-demanded speed or torque as suggested by the Bhavsar et al. reference at column 7 lines 53 to 65.

**b. Regarding the features of claim 3:** wherein the controller detects termination of the braking condition and activates all of the cylinders in response to such termination, the system of Bhavsar et al. further teaches a controller that detects a change in the system state and can

respond by activating all of the cylinders in response as appropriate (refer col 5, line 35 to col 6, line 14).

c. **Regarding claim 4:** wherein the controller monitors a vehicle speed and activates the at least one of the cylinders when the vehicle speed achieves a threshold (refer Bhavsar et al. col 5, lines 4-8, lines 13-23, and lines 30-45).

d. **Regarding claim 5:** wherein the controller selectively operates the electric machine in the motor mode to drive the wheel of the vehicle (refer Bhavsar et al. col 5, lines 24-47 and see Fig 3, the operational flow path 52-54-58-64, and where the battery supplies the current to the electrical machine (col 4, lines 1-2)).

e. **Regarding claim 6:** wherein the controller selectively deactivates all of the cylinders of the engine and operates the electric machine in the motor mode to drive the vehicle wheel (see Bhavsar et al., Fig 3, the “EM Mode”, Block 64, and refer to the associated text of the reference).

*Claim Rejections - 35 USC Sections 102 or 103(a)*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States;

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-10, 12 and 13-16 are rejected under 35 U.S.C. 102 as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as being obvious over Tamai et al. (6307277) in view of Bhavsar et al. (US 6691807).

a. As discussed above, the combination of Tamai et al. (-277) and Bhavsar et al. as **applied to claim 1 discloses** a regenerative braking system for a vehicle in which the system comprises a controller for a Displacement on Demand (DOD) engine capable of having one or more of its cylinders deactivated while maintaining at least another cylinder of the engine active, and having an electrical machine and a battery and driving the electrical machine in a generator mode with a wheel of the vehicle to charge the battery; and, **as applied to claim 5 discloses** **wherein** the controller selectively operates the electric machine in a motor mode to drive the wheel of the vehicle; and **further as applied to claim 1 discloses** wherein the battery supplies electrical current to the electrical machine and the controller detects a braking condition and controls the activation and deactivation of the cylinders of the engine in response to a vehicle operating condition in which the method (the steps of the method of claims 8-10, 12, and 13-16) is considered inherent.

b. The Examiner posits that the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1 and 3-6 teaches the claimed method of the claims 8-10, 12 and 13-16 because the method is inherently disclosed. The rationale for this inherency is that the system of the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1 and 3-6, in its normal and usual application would necessarily require the claimed steps: of **claim 8** (detecting a braking condition of the vehicle, deactivating at least one cylinder of the engine in

response to the braking condition while maintaining at least another cylinder of the engine active; and driving the electric machine in a generator mode with a wheel of the vehicle to charge the battery); of **claim 9** (activating the electric machine in a drive mode to drive the vehicle wheel); of **claim 10** (providing electrical current to the electrical machine from the battery); and of **claim 12** (detecting termination of the braking condition and activating at least one of the cylinder(s) in response to that termination); and the claimed steps: of **claim 13** (detecting a braking condition of the vehicle; deactivating a cylinder of the engine in response to the braking condition while maintaining at least another cylinder of the engine active; retarding motion of the vehicle by driving an electric machine in a generator mode with a wheel of the vehicle to generate electrical current; detecting termination of the braking condition; and activating the cylinder and relieving the retarding in response to the termination); and of **claim 14** (charging a battery with electrical current); and of **claim 15** (activating the electric machine in a drive mode to drive the wheel of the vehicle; and of **claim 16** ( providing electrical current to the electrical machine from a battery). See MPEP Sec. 2112.02, and refer *In re King*, 801 f2d 1324, 1326; 231 USPQ 136, 138 (Fed Cir 1986).

c. However, even if not inherent , it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Tamai et al. (-177) and Bhavsar et al. as applied above to include the claimed method steps of claims 8-10, 12 and 13-16.

Therefore, because the prior art discloses all the structure necessary to perform the claimed functions, one of ordinary skill in the art would find the claimed method to be an

obvious step in light of the disclosed structures of the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1 and 3-6.

*Response to Arguments*

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

*Action made Final - Necessitated by Amendment*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

*Prior Art made of Record*

9. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The prior art of Tabata et al.; of Matsubara et al.; of Hanada et al.; of Wakashiro et al.(-320; and -460); and of Glugla et al. each show features in common with some of the other structures of the inventive concept disclosed in the instant application.

*Conclusion*

10. Any inquiry concerning this or earlier communication(s) from the examiner should be directed to Gerald B. Klebe at 571-272-6695; Mon.-Fri., 8:00 AM - 4:30 PM ET, or to Supervisory Patent Examiner Christopher P. Ellis, Art Unit 3618, at 571-272-6914.

Official correspondence should be sent to the following TC 3600 Official number as follows: 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 / Art Unit 3618 / 16 November 2005

